What is claimed is:

1. A silica-filled encapsulant composition for electrical connections, comprising a "core-shell" substance including a fine powder, whose particles each have an outer shell with a glass transition temperature above room temperature, and a core with a glass transition temperature below room temperature.

2. The silica-filled encapsulant composition in accordance with claim 1, wherein silica fill is in a range of between approximately 40 and 60 percent by weight of the total encapsulant composition.

3. The silica-filled encapsulant composition in accordance with claim 1, wherein said encapsulant composition has a toughness of between approximately 800 and 2,500 psi-$in^{1/2}$.

4. The silica-filled encapsulant composition in accordance with claim 1, including a silane component.

5. The silica-filled encapsulant composition in accordance with claim 1, including at least one from the group of epoxy resins, polyimides, cyanide esters, and combinations thereof.

6. The silica-filled encapsulant composition in accordance with claim 5, wherein said epoxy resin comprises a cycloaliphatic epoxy resin and/or a glycidyl epoxide resin.

7. The silica-filled encapsulant composition in accordance with claim 5, wherein said epoxy resin comprises a cycloaliphatic epoxy resin in an approximate weight range of between 14 and 25 percent by weight of the total encapsulant composition.

8. The silica-filled encapsulant composition in accordance with claim 2, comprising a cycloaliphatic epoxy resin in an approximate weight range of between 14 and 25 percent by weight of the total encapsulant composition.

9. The silica-filled encapsulant composition in accordance with claim 2, comprising a cycloaliphatic epoxy resin and a methyl-hexa-hydrophthalic anhydride both respectively in an approximate weight range of between 14 and 25 percent by weight of the total encapsulant composition.

10. The silica-filled encapsulant composition in accordance with claim 9, including a silane component.

11. A silica-filled encapsulant composition for electrical connections, comprising:

a) silica fill in a range of approximately between 40 and 60 percent by weight of the total encapsulant composition; and

b) an epoxy resin and an anhydride both respectively in an approximate weight range of between 14 and 25 percent by weight of the total encapsulant composition.

12. The silica-filled encapsulant composition in accordance with claim 11, wherein said composition has a toughness of between approximately 800 and 2,500 psi-$in^{1/2}$.

13. The silica-filled encapsulant composition in accordance with claim 11, including a silane component.

14. The silica-filled encapsulant composition in accordance with claim 11, wherein said epoxy resin comprises a cycloaliphatic epoxy resin and/or a glycidyl epoxide resin.

15. The silica-filled encapsulant composition in accordance with claim 11, wherein said anhydride comprises a methyl-hexa-hydrophthalic anhydride.

16. A silica-filled encapsulant composition for electrical connections, comprising:

a) silica fill in a range of approximately between 40 and 60 percent by weight of the total encapsulant composition; and

b) a cycloaliphatic epoxy resin and a methyl-hexa-hydrophthalic anhydride both respectively in an approximate weight range of between 14 and 25 percent by weight of the total encapsulant composition.

17. The silica-filled encapsulant composition in accordance with claim 16, wherein said encapsulant composition has a toughness of approximately between 800 and 2,500 psi-$in^{1/2}$.

18. The silica-filled encapsulant composition in accordance with claim 16, including a silane component.

19. The silica-filled encapsulant composition in accordance with claim 16, including 2-ethyl-4-methylimidazole as a catalyst.

20. The silica-filled encapsulant composition in accordance with claim 16, further comprising a wetting agent.

21. A method of encapsulating an integrated circuit chip and a substrate associated therewith, said substrate comprising organic materials, to form a chip carrier, the steps comprising:

applying a silica-filled encapsulant composition to an IC chip and associated substrate, said composition comprising particles having a core material with a glass transition temperature, T_g, below room temperature and a core-shell material substantially surrounding said core material, said core-shell material having a T_g above room temperature;

curing said encapsulated IC chip and substrate; and

reflowing solder joints between said IC chip and said substrate.

22. The method of encapsulating an integrated circuit chip and a substrate associated therewith in accordance with claim 21, wherein silica fill is in a range of between approximately 40 and 60 percent by weight of the total encapsulant composition.

23. The method of encapsulating an integrated circuit chip and a substrate associated therewith in accordance with claim 21, wherein said encapsulant composition has a toughness of between approximately 800 and 2,500 psi-$in^{1/2}$.

24. The method of encapsulating an integrated circuit chip and a substrate associated therewith in accordance with claim 21, including a silane component.

25. The method of encapsulating an integrated circuit chip and a substrate associated therewith in accordance with claim 21, including at least one from the group of epoxy resins, polyimides, cyanide esters, and combinations thereof.

26. The method of encapsulating an integrated circuit chip and a substrate associated therewith in accordance with claim 25, wherein said epoxy resin comprises a cycloaliphatic epoxy resin and/or a glycidyl epoxide resin.

27. The method of encapsulating an integrated circuit chip and a substrate associated therewith in accordance with claim 25, wherein said epoxy resin comprises a cycloaliphatic epoxy resin in an approximate weight range of between 14 and 25 percent by weight of the total encapsulant composition.

28. The method of encapsulating an integrated circuit chip and a substrate associated therewith in accordance with claim 22, wherein said composition comprises a cycloaliphatic epoxy resin in an approximate weight range of between 14 and 25 percent by weight of the total encapsulant composition.

29. The method of encapsulating an integrated circuit chip and a substrate associated therewith in accordance with claim 22, comprising a cycloaliphatic epoxy resin and a methyl-hexa-hydrophthalic anhydride both respectively in an approximate weight range of between 14 and 25 percent by weight of the total encapsulant composition.

30. The method of encapsulating an integrated circuit chip and a substrate associated therewith in accordance with claim 29, including a silane component.

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